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SUMMARY

In 2004, we conducted surveys for Southwestern Willow Flycatchers and Yellow-billed Cuckoos on Spur Land and Cattle Company property located along the Verde River in Camp Verde, Arizona. Flycatcher surveys were conducted four times between 17 May and 29 July. We surveyed for Yellow-billed Cuckoos during 4 different time periods between 1 June and 15 August. We detected one migrant Willow Flycatcher (subspecies unknown), and one Southwestern Willow Flycatcher breeding territory; the territorial pair made one nesting attempt. There was a total of five Yellow-billed Cuckoo detections within the property. Both the flycatcher and cuckoo detections occurred in mixed-native riparian habitat.

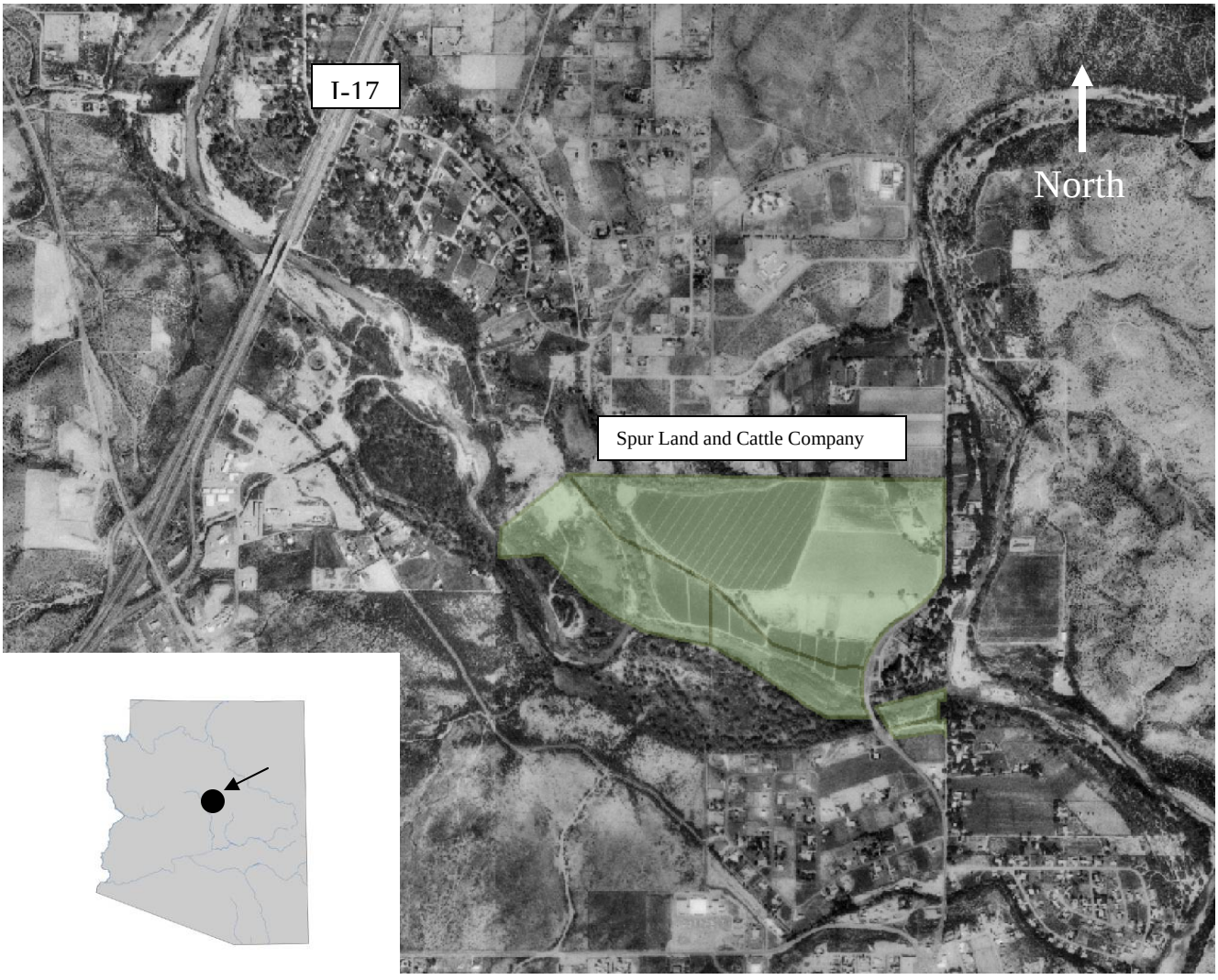
INTRODUCTION

The Southwestern Willow Flycatcher (*Empidonax traillii extimus*) is a small passerine bird that was listed as endangered in 1995 by the U.S. Fish and Wildlife Service (USFWS 1995); the primary causes for its decline were probably habitat loss and modification (USFWS 2002). The flycatcher nests only in dense, typically wet, riparian habitats on its North American breeding grounds, and winters in portions of Central America and northern South America (Sogge and Marshall 2000, USFWS 2002). Approximately 1,100 breeding pairs remain throughout the Southwest (Sogge et al. 2003). Most of the currently known population occurs in Arizona, New Mexico, and California (Paradzick and Woodward 2003). A flycatcher breeding site has been occupied along the Verde River below the I-17 bridge since at least 1994, though the breeding population at this site has declined since the late 1990s (USGS unpublished data).

The Yellow-billed Cuckoo (*Coccyzus americanus*) is a neotropical migrant that breeds throughout northern Mexico, the United States, and southern Canada (Hughes 1999). Cuckoo populations have declined throughout the species' range; western populations in particular have suffered catastrophic reductions in the 20th century (Laymon and Halterman 1987, Hughes 1999, Corman and Magill 2000). Consequently, on July 25, 2001, the Yellow-billed Cuckoo became a Candidate Species under the Endangered Species Act (ESA; USFWS 2001). Candidate Species are those species for which the U.S. Fish and Wildlife Service has sufficient information to support proposals to list them as Endangered or Threatened, but proposed rules have not been issued because such actions are precluded at present by other listing activity (AGFD 2002). Probable factors contributing to population declines are the loss, fragmentation, and alteration of native riparian breeding habitat, the possible loss of wintering habitat, and pesticide use on breeding and wintering grounds (Corman and Magill 2000). Yellow-billed Cuckoos have been detected periodically along the Verde River from the I-17 bridge downstream to the Black Bridge in Camp Verde (Corman and Magill 2000).

The Spur Land and Cattle Company (SLCC) manages an approximately 300-acre parcel of land along the Verde River, near Camp Verde, Arizona (Figure 1). Although portions of this parcel are used for agriculture production (primarily corn), the property also hosts extensive amounts of riverine and riparian habitat. Given that Southwestern Willow Flycatchers and Yellow-billed Cuckoos occur in the nearby riparian habitats along the Verde River, there was potential for flycatchers and cuckoos to be present on the SLCC parcel. At the request of SLCC, the Ecological Monitoring & Assessment Program & Foundation at Northern Arizona University (EMAP) collaborated with the USGS Colorado Plateau Research Station (CPRS) to search for Southwestern Willow Flycatchers and Yellow-billed Cuckoos within potentially suitable habitat on these SLCC lands. This report details the results of those surveys.

Figure 1. Location of Spur Land and Cattle Company property (shaded area) along the Verde River, near Camp Verde, Arizona.



METHODS

This project involved standardized surveys to document the presence and habitat use of Southwestern Willow Flycatchers and Yellow-billed Cuckoos within the riparian areas on SLCC property along the Verde River in Camp Verde (Figure 1). Both flycatcher and cuckoo survey sites were selected using the "look see" method. This method was employed during previous CPRS and Arizona Game and Fish Department (AGFD) Yellow-billed Cuckoo surveys and, as described by Bibby et al. (1992), calls for identification of suitable habitats prior to conducting surveys. The method relies on prior knowledge of possible habitat preferences, expert opinion, and knowledge of the basic biology of the species in question (Sogge et al. 1997, Corman and Magill 2000). It is a preferred method for surveying rare birds (Dawson 1981, Corman and Magill 2000) when the goal is detection of all occurrences of a species within project-related constraints.

Southwestern Willow Flycatcher Surveys

We searched for Willow Flycatchers within all potentially suitable habitat types in the study area, using the US Fish and Wildlife Service mandated protocol (Sogge et al. 1997). The protocol requires a minimum of three separate surveys, one each in the early (15- 31 May), middle (1 -21 June), and late (22 June – 17 July) breeding season. Surveys were conducted between 0500 and 1000 hrs.

To conduct these surveys, experienced biologists walked carefully and quietly through all potential flycatcher breeding habitat, pausing periodically to broadcast (with a tape-player or other device) pre-recorded songs and calls of breeding Willow Flycatchers. Vocalizations were broadcast to elicit a territorial response (e.g., songs and calls) from any flycatchers with an established breeding territory in that patch (Sogge et al. 1997). Because the Willow Flycatcher appears very similar to several other Empidonax flycatchers, surveyors must hear the species' characteristic "fitz-bew" song to confirm the bird's identity as a Willow Flycatcher. All lead surveyors during this project had completed the standardized survey protocol training provided by the USFWS and AGFD.

If a Willow Flycatcher was confirmed responding to the playback, surveyors carefully approached it to see the bird and determine the exact detection site. Because migrant Willow Flycatchers of other non-endangered subspecies will also respond to broadcast surveys, surveyors also observed each detected bird to discern if it was holding a breeding territory, and to look for a mate and/or nest. Only by locating a nest, or by detecting a Willow Flycatcher during the non-migrant period (22 June – 17 July), could its identity be confirmed as a locally-territorial Southwestern Willow Flycatcher (Sogge et al. 1997).

We used a Global Positioning System (GPS) unit to collect spatial coordinates (in Universal Transverse Mercators [UTMs]) of the detection location, and took digital photographs of the habitat.

Yellow-billed Cuckoo Surveys

Presence/absence Surveys for Yellow-billed Cuckoos were conducted following established methodologies (see below; Laymon 1998, Corman and Magill 2000, Halterman et al. 2002). These methods recommended a minimum of three surveys between 25 May and 31 August, and that surveys be conducted 10 to 14 days apart. The time between surveys allows for covering the various stages of the nesting cycle and, therefore, increases the likelihood of detecting breeding cuckoos.

To assure data comparability with other Yellow-billed Cuckoo studies, and the repeatability of this study, all surveyors completed Yellow-billed Cuckoo training prior to conducting surveys. This training was directly comparable to the survey techniques and guidelines suggested by Corman and Magill (2000) and Halterman et al. (2002). Surveyors were instructed in using standardized survey forms and interpreting cuckoo behavior.

The surveys consisted of using playback of a taped recording of the Yellow-billed Cuckoo's "kwolp" call. Playback equipment was capable of projecting calls at least 100 m with minimum distortion. Surveys were conducted between the hours of 0600 and 1200 hrs, and were terminated if shade temperatures exceeded 100°F (38°C) or during high wind or steady rainfall. One transect was made through the habitat for every 200 m of habitat width. The surveyor initially approached the beginning of each transect, and remained quiet for a 1-minute period to acclimate to the ambient noise and to listen for spontaneously calling cuckoos. If no cuckoos were heard in this 1-minute period, the surveyor then played the "kwolp" call once, followed by one minute of silence to listen for a response.

If no detections occurred, this playback-listen technique was repeated an additional four times. The surveyor then moved 100 m along the transect and began the listen-playback-listen protocol anew. If a cuckoo was detected at the survey point, UTM coordinates were recorded and given a unique detection label. The surveyor then moved 300 m before resuming survey playbacks. This 300 m distance between calls was considered necessary to reduce the probability of re-detecting and/or attracting the previously detected individual.

During the surveys, we: a) recorded cuckoo detections on a survey form and attempted to determine if the bird was paired or unpaired; b) plotted all points of detection on maps (orthorectified aerial photos) of the site and recorded UTM coordinates using GPS; c) recorded UTM coordinates using GPS, compass bearing and estimated distance (in meters) to where the first call was heard, noting all survey site boundaries including start and stop points, regardless of occupancy by cuckoos; d) provided a general site description of each site surveyed and characterized the habitat (dominant tree species composition); and e) digitally photographed survey areas.

If Yellow-billed Cuckoos were detected, we returned to the area after the survey was completed and attempted to observe them non-intrusively for extended periods. Our goals were to: A) determine the number of individuals; B) verify that there was a nesting pair; and C) determine their stage of nesting.

RESULTS

Southwestern Willow Flycatcher Surveys

We conducted three flycatcher survey visits, and one nest site visit, between 17 May and 29 July 2004. Details of each survey are shown in Table 1. During the first survey visit, we detected two flycatchers on the south side of the Verde River, adjacent to SLCC property; however, because they were not on SLCC lands, we did not investigate the site. We also detected one Willow Flycatcher near the upstream end of the SLCC site (Figure 2), but based on a lack of later detections we considered this a likely migrant. UTM coordinates of all flycatcher detection sites are detailed in Table 2 and shown in Figure 3.

During the second survey, we detected the first probable territorial Willow Flycatcher on the SLCC parcel, in mixed willow-saltcedar habitat along the large pond located east of the river corridor (Figures 4 and 5). On the third survey visit (which occurred during the non-migrant period), this site hosted a singing male flycatcher and its mate, and we located an active flycatcher nest (Figures 6 and 7). This confirmed the presence of breeding Southwestern Willow Flycatchers on the SLCC property.

Figure 2. Habitat at location of probable migrant Willow Flycatcher at Detection site 2.

Table 1. Summary of Southwestern Willow Flycatcher surveys at the Spur Land and Cattle Company property, 2004. Format of this table corresponds to the mandated flycatcher survey data sheet.

Survey # Observer(s)	Date (m/d/y) Survey time	# Adult WIFLs detected	# of Territories on SLLC lands	Nest(s) Found? Y or N	Comments
1. Mark Sogge	Date 5-17-04 Start 0610 hrs Stop 0930 hrs Total hrs 3.3	3	U	N	Two WIFLs detected across river from SLLC lands (Detection site 1). Another WIFL first detected across river, just downstream of SRP WIFL site, then flew across to NW corner of SLCC property to fitz-bew (Detection site 2).
2. Mark Sogge Dave Lamkin Marcia Lamkin Karan English	Date 6-2-04 Start 0550 hrs Stop 0930 hrs Total hrs 3.5	2	1	N	One WIFL fitz-bewing from same off-site location noted in Detection 1 above; no sign of second WIFL there. No WIFL at Detection 2 site above. WIFL located fitz-bewing away from river at large pond (Detection site 3).
3. Mark Sogge Dave Lamkin	Date 7-10-04 Start 0515 hrs Stop 0800 hrs Total hrs 2.7	2	1	Y	No detections at sites 1 or 2. Singing male and mate found at pond (Detection site 3). Female flew to nest and incubated non-stop for approximately 20 minutes: probably on eggs. Nest in tamarisk tree in dense tamarisk/willow stand. Note female had slightly deformed bill.
4. Mark Sogge	Date 7-29-04 Start 0500 Stop 0530 Total hrs 0.5	0	0	Y	Trip to check nest only; no survey conducted. No sign of adult or young flycatchers. Nest still present and intact; no eggs or other contents in nest cup.

Table 2. UTM coordinates of all Willow Flycatcher detections over the course of this survey. Coordinates are in Zone 12, NAD 27 datum. Coordinates of Detection site 1 are approximated from aerial photography.

Date First Detected (and site number)	UTM (E)	UTM (N)
5-17 (Detection site 1)	420264	3826238
5-17 (Detection site 2)	420197	3826368
6-02 (Detection site 3)	420459	3826401
WIFL nest location	420501	3826383

Figure 3. Aerial photograph showing location of all Willow Flycatcher detection site coordinates (filled circles). Note that the location of Detection site 1 was approximated based on remote observation. Boundaries of the Spur Land and Cattle Company parcels are outlined in yellow.

Figure 4. Exterior view of the habitat at the Southwestern Willow Flycatcher breeding territory (Detection site 3), from the northwest. The approximate center of the flycatcher territory is indicated by the arrow.

Figure 5. Interior view of the habitat in the Southwestern Willow Flycatcher breeding territory (Detection site 3).

Figure 6. Southwestern Willow Flycatcher nest location (indicated by the black arrow), approximately 5 m high within a saltcedar tree, at Detection site 3. Note the surveyor (Dave Lamkin) at lower left, for scale.

Figure 7. Southwestern Willow Flycatcher nest at Detection site 3; note that the bill and left side of the female flycatcher's head is visible atop the nest.

Yellow-billed Cuckoo Surveys

We visited the Spur Land and Cattle Company property to evaluate Yellow-billed Cuckoo habitat availability before the surveys started, then surveyed for cuckoos at nine separate points (Table 3). Each point was selected according to habitat criteria (riparian zone) within the property boundaries. Distance between each point was at a minimum of 100 m apart; if a cuckoo was detected at a point, the next point was placed 300 m from the detection point.

Table 3. Yellow-billed Cuckoo points surveyed at Spur Land and Cattle Company located along the Verde River in Camp Verde, AZ - 2004.

YBCU Point	UTM (E)	UTM (N)
SL01	420496	3826495
SL02	420611	3826210
SL03	420898	3826118
SL04	420996	3826078
SL05	421029	3826035
SL06	421192	3826002
SL07	421294	3825941
SL08	421513	3825831
SL09	421609	3825868

We conducted Yellow-billed Cuckoo surveys during three visits, and made a total of five cuckoo detections (Table 4; Figure 8). We also completed a fourth visit on 15 August 2004 to determine breeding status of the two cuckoos detected during our third visit, and attempted to search for a nest of this possible pair. No cuckoos or nests were located during this visit.

All of the cuckoos we detected were located in tall, dense habitat with an upper canopy consisting primarily of cottonwoods, and a dense understory of saltcedar, willow, and mesquite (Figures 9 and 10).

Table 4. List of the dates for Yellow-billed Cuckoo surveys and total number of cuckoos detected on Spur Land and Cattle Company property, along the Verde River, AZ - 2004.

VISIT #	OBSERVERS	DATES (04)	YBCU DETECTIONS
1	M. Johnson, J. Holmes, C. Calvo, E. Nelson	6/11/04	1
2	M. Johnson, J. Holmes	07/09/04	2
3	M. Johnson, K. English	08/05/04	2
4	M. Johnson	08/15/04	0
			Total = 5

The number of detections gradually increased from the first visit and peaked on the second and third visits. During the third visit (05 August) we detected two cuckoos counter singing within 100 m of each other (Table 5).

Table 5. Yellow-billed cuckoo detection locations for Spur Land and Cattle Company, along the Verde River, AZ - 2004.

Date	Time	Survey Point	UTM (E)	UTM (N)	Compass Bearing	Distance to YBCU	Comments
6/11/04	0709	01	420511	3826576	274^{o}	50 m	YBCU knocker call after 4th playback recording
7/09/04	0617	01	420496	3826495	90^{o}	15 m	YBCU knocker call after 2nd playback recording
7/09/04	0635	02	420611	3926210	360^{o}	150 m	YBCU kwolp call after 2nd playback recording; could be same bird heard at Pt 01.
8/05/04	0620	01	420523	3826305	310^{o}	55 m	YBCU kwolp call after 1st playback recording
8/05/04	0621	02	420668	3826345	200^{o}	80 m	2nd YBCU kwolp call being given counter to YBCU previously heard a minute before.

Figure 8. Aerial photograph showing the location of all Yellow-billed Cuckoo survey sites (filled circles) and estimated cuckoo detection locations (filled triangles). Boundaries of the Spur Land and Cattle Company parcels are outlined in yellow.

Figure 9. Exterior view (from the northwest) of Yellow-billed Cuckoo habitat adjacent to the large pond. The cuckoo detection location is indicated by the arrow.

Figure 10. Exterior view (from the east) of Yellow-billed Cuckoo habitat along the agricultural fields in the western portion of the Spur Land and Cattle Company property. Approximate cuckoo detection locations are indicated by the arrows.

DISCUSSION

The Spur Land and Cattle Company contains extensive tracts of riparian habitat, both in low areas within the primary channel of the Verde River and on the upper terraces bordering the cultivated plateau. Most of the riparian vegetation immediately bordering the river is relatively young (less than 10 years old) and short stature, likely because high flows within the Verde River periodically "scour" these areas. Much of the willow and cottonwood habitat in the upper areas is older and tall (>10 m high), and could be described as "gallery" habitat. In some places, ponds and/or irrigation ditches provide water to these terrace riparian habitats, creating wet (mesic) conditions that would not otherwise be present at that distance from the river. Overall, the extent and diversity of riparian habitats provides habitat and resources for a large number and a diversity of wildlife species, including many birds. Among those are the Southwestern Willow Flycatcher and the Yellow-billed Cuckoo.

During one previous survey trip to the SLCC property in 1996, an observer (Sogge) heard several Yellow-billed Cuckoos, but could not determine their precise locations. On that same visit, no Willow Flycatchers were detected. Therefore, 2004 is the first time that formal surveys have confirmed the presence of breeding flycatchers and potentially-breeding cuckoos on Spur Land and Cattle Company property.

Even though (a) both flycatchers and cuckoos are known to occur at multiple sites along the Verde River, both upstream and downstream of the SLCC property, and (b) the SLCC property includes suitable habitat for both species, there was no guarantee that either species would be present on the property. This is especially true for Southwestern Willow Flycatchers, which are not always found in habitat that appears suitable (Sogge and Marshall 2000).

Southwestern Willow Flycatchers tend to use wetter, younger, and earlier seral stage riparian habitats than do Yellow-billed Cuckoos, and to be found primarily at sites with dense vegetation structure in the layer 4-6 m above ground. Indeed, the site of the single flycatcher territory was found in very marshy habitat along the edge of the large pond, where a dense understory of 5-10 m tall saltcedar was growing underneath large gallery willow trees. Currently, there is limited habitat that appears suitable for breeding flycatcher, and the territory we found was located in what appeared to be the most suitable patch. If no large scouring flows occur within the main river corridor in the next five or more years, additional suitable Southwestern Willow Flycatcher habitat may develop.

During these surveys, Yellow-billed Cuckoos were detected in riparian habitat consisting of a cottonwood upper canopy with a dense understory of saltcedar, willow, and mesquite. The Western Yellow-billed Cuckoo not only depends on riparian habitat, but also appears to require large blocks of riparian habitat for breeding (USFWS 2001). Therefore, an important consideration in interpreting the results of the Yellow-billed Cuckoo detections on the SLCC property is the limited survey area. Home ranges of breeding cuckoos are relatively large (over 10 ha/25 acres; Hughes 1999) and likely extend beyond the borders of the SLCC property. In fact, Yellow-billed Cuckoos were heard calling from areas adjacent to but outside of the Spur Land and Cattle Company's northwest section. We were unable to determine whether these detections represented additional cuckoos or the same individuals detected on the SLCC property. The ability to access areas adjacent to the SLCC lands would enable us to better achieve our objectives to estimate the number of cuckoos present, determine their breeding status, and to locate nests.

It has also been found that local populations of Yellow-billed Cuckoos can be highly variable, in terms of abundance per year, depending on food availability (Veit and Petersen 1993). The ongoing drought in Arizona has likely influenced the availability of their prey, which are primarily large insects. This, in turn, has likely influenced Yellow-billed Cuckoo habitat occupancy and site tenacity both within a breeding season and from year to year. Cuckoos may wander through seemingly appropriate habitat and assess food availability; the availability of food may then influence the probability of remaining at a site, forming a pair bond, and nesting (Hamilton and Hamilton 1965).

Furthermore, given the difficulty in locating active cuckoo nests, which can often be placed high up in extremely dense vegetation, the fact that we did not locate a nest should not be interpreted to mean that no nesting occurred on the site

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